

(faculty stamp)

**COURSE DESCRIPTION**

Z1-PU7

WYDANIE N1

Strona 1 z 2

1. Course title: RENEWABLE ENERGY TECHNOLOGIES		2. Course code		
3. Validity of course description: 2013/2014				
4. Level of studies: 2 <sup>nd</sup> cycle of higher education				
5. Mode of studies: intramural studies				
6. Field of study: INDUSTRIAL AND ENGINEERING CHEMISTRY		RCH		
7. Profile of studies: -				
8. Programme: PROCESS ENGINEERING FOR GREEN CHEMICAL TECHNOLOGIES				
9. Semester: 2				
10. Faculty teaching the course: Department of Chemical Engineering and Process Design				
11. Course instructor: Marcin Lemanowicz, Ph.D.				
12. Course classification: field				
13. Course status: compulsory				
14. Language of instruction: English				
15. Pre-requisite qualifications: basic knowledge of Chemistry, Physics, Transport Phenomena and Unit Operations				
16. Course objectives: An objective of the course is presenting to students the current state of renewable energy technologies.				
17. Description of learning outcomes:				
No	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	Student possesses the basic knowledge concerning renewable energy technologies	test	lecture	K2A_W02 + K2A_W03 + K2A_W09 +++
2.	Student is able to carry out simple calculations concerning design of chosen renewable energy technologies	test	lecture	K2A_U09 + K2A_U20 +
3.	Student, in individual cases, can identify the potential sources of renewable energy in order to replace conventional energy sources	test	lecture	K2A_U12 +++ K2A_U17 +
4.	Student uses literature data, internet, electronic databases and data processing/communication techniques in gaining knowledge and in design works	test	lecture	K2A_U01 +++ K2A_U04 ++
5.	Student understands the necessity of further professional training and the development of his/her engineering and personal competence	observation and discussion	lecture, consultation	K2A_K01 +++
18. Teaching modes and hours				
Lecture / BA /MA Seminar / Class / Project / Laboratory				
Lecture sem 2 - 15 h				

**19. Syllabus description:**

**Lecture:** During the lectures the following renewable energy sources will be presented:

- Solar energy (solar radiation, photovoltaic systems)
- Ocean thermal, tidal and wave
- Hydropower (water turbines, hydroelectric systems)
- Wind energy (wind turbines, wind energy sources)
- Geothermal energy

Moreover, some issues concerning impact of renewable energy technologies on the environment, economics, legislation, social framework will be discussed. Furthermore, students will solve some simple calculation tasks related with the design of renewable energy technologies.

**20. Examination:** no

**21. Primary sources:**

G.N. Tiwari, R.K. Mishra, *Advanced Renewable Energy Sources*, Royal Society of Chemistry, Cambridge, 2012.

B. Sorensen, *Renewable Energy, 4th Edition: Physics, Engineering, Environmental Impacts, Economics & Planning*, Academic Press, London, 2011.

G. Boyle (ed.), *Renewable Energy: Power for sustainable future*, Oxford University Press, Oxford, 2012.

**22. Secondary sources:**

G. Jastrzębska, *Odnawialne źródła energii i pojazdy proekologiczne*, WNT, Warszawa 2007.

The Internet (e.g. European Union website etc.)

**23. Total workload required to achieve learning outcomes**

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	15/10
2	Classes	-/-
3	Laboratory	-/-
4	Project	-/-
5	BA/ MA Seminar	-/-
6	Other	-/5
	Total number of hours	15/15

**24. Total hours:** 30

**25. Number of ECTS credits:** 1

**26. Number of ECTS credits allocated for contact hours:** 0,5

**27. Number of ECTS credits allocated for in-practice hours (laboratory, classes, projects):** -

**26. Comments:**

Approved:

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(date, Instructor's signature)

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(date, the Director of the Faculty Unit signature)